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(54) **Hole puncher**

Locher

Perforateur

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Description

1. Field of the Invention

[0001] The present invention relates to a puncher, and more particularly to a hole puncher that saves a user's effort when the user employs the hole puncher to punch holes through paper sheets.

2. Description of Related Art

[0002] A conventional hole puncher comprises has a base, a handle, an articulated assembly and multiple cutters. The articulated assembly is connected pivotally to the base and the handle. The cutters are connected to the articulated assembly and are mounted slidably in the base. When the handle is pushed down, the cutters are driven down to cut paper sheets that extend into the base.

[0003] Such a puncher, which discloses the features of the preamble of claim 1, is known from DE 2 017 749 A1.

[0004] US patents No. 5,163,350 entitled at "paper sheets punching apparatus" has a complicated structure therefore the cost of the punching apparatus is high.

[0005] Another US patent No. 6,032,566 entitled at "lever operated punch with strengthened flap and punch head adjustment arrangement" has an improved effort-saving design allowing a user to easily operate the punch without much strenuous effort. However, the effort-saving effect is limited.

[0006] To overcome the shortcomings, the present invention provides a hole puncher to mitigate or obviate the aforementioned problems.

[0007] The hole puncher of the present invention comprises the features of claim 1.

[0008] The main objective of the invention is to provide a hole puncher that saves a user's effort when the user employs the hole puncher to punch holes through paper sheets.

[0009] A hole puncher comprises a base, multiple cutter brackets, multiple cutters, multiple springs, a linkage, an activating member and a handle. The base has two ends. The cutter brackets are mounted on the base. The cutters (7) are mounted slidably through the cutter brackets. The linkage connects pivotally to one end of the base. The activating member connects pivotally to the linkage. The handle connects pivotally to the other end of the base and selectively pivots the linkage down. With the linkage and the activating member, the hole punch is effort-saving.

[0010] Other objectives, advantages and preferred features of the invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

IN THE DRAWINGS

[0011]

Fig. 1 is a perspective view of a first embodiment of a hole puncher in accordance with the present invention;

Fig. 2 is an exploded perspective view of the hole puncher in Fig. 1;

Fig. 3 is a side view in partial section of the hole puncher in Fig. 1;

Fig. 4 is an operational side view in partial section of the multiple hole puncher in Fig. 3 with the handle pushed down;

Fig. 5 is a perspective view of a second embodiment of a hole puncher in accordance with the present invention;

Fig. 6 is a side view of a third embodiment of a hole puncher in accordance with the present invention; and

Fig. 7 is a cross sectional perspective view of a fourth embodiment of a hole puncher in accordance with the present invention.

[0012] With reference to Figs. 1, 5, 6 and 7, a hole puncher in accordance with the present invention comprises a base (10, 10B), multiple cutter brackets (9), multiple cutters (7), multiple springs (8), a linkage, an activating member (3) and a handle (1, 1C). The hole puncher may further comprise a lock device.

[0013] With further reference to Figs. 2 and 3, the base (10, 10B) has a front end, a rear end, a bottom surface, a top surface, multiple through holes (14), a linkage bracket (12, 12B) and a handle bracket (11, 11B) and may further have a bottom cover (15).

[0014] The through holes (14) are defined through the base (10, 10B) in a row.

[0015] The linkage bracket (12,12B) is attached to the front end of the base (10, 10B) and may have two wings. Each wing has a pivot hole (120). In a first embodiment of the hole puncher, the linkage bracket (12) is U-shaped, is mounted on the bottom surface of the base (10) with the wings extending up through the base (10) out of the top surface. In a second embodiment of the hole puncher, the linkage bracket (12B) is formed integrally on the front end of the base (10B).

[0016] The handle bracket (11, 11 B) is attached to the rear end of the base (10, 10B) and may have two wings. Each wing of the handle bracket (11, 11B) has a pivot hole (110). In the first embodiment, the handle bracket (11) is U-shaped, is mounted on the bottom surface of the base (10) with the wings extending up through the base (10) out of the top surface. In the second embodiment, the handle bracket (11B) is formed integrally on the rear end of the base (10B).

[0017] The bottom cover (15) is mounted on the bottom surface of the base (10, 10B) and serves as a scrape container to collect scrapes cut from paper sheets.

[0018] The cutter brackets (9) are hollow, are mounted on the base (10, 10B), correspond respectively to the through holes (14) and may receive a paper sheet. Each cutter bracket (9) may have a frame (90), a seat (91), a

gap and has a guide hole (92).

[0019] The frame (90) is hollow and has an inner top surface and an inner bottom surface.

[0020] The seat (91) is formed on the frame (90) and is mounted on the base (10, 10B).

[0021] The gap is defined between the frame (90) and the seat (91) and may receive the paper sheet.

[0022] The guide hole (92) is defined through the cutter bracket (9), is aligned with a corresponding through hole (14) in the base (10,10B) and may be defined through the frame (90) and the seat (91) and communicate with the gap.

[0023] The cutters (7) correspond respectively to the cutter brackets (9), are slidably mounted respectively through the guide holes (92) and each cutter (7) has a top end, a bottom end, a blade and a clasp (75). The blade is formed on the bottom end. The clasp (75) is mounted radially on the cutter (7), selectively abuts a corresponding cutter bracket (9) and may selectively abut the inner top surface of the frame (90) of the corresponding cutter bracket (9).

[0024] The springs (8) correspond respectively to and are mounted respectively in the cutter brackets (9), press respectively against the clasps (75) and respectively bias the cutters (7) up from extending completely through the cutter brackets (9). Preferably, each spring (8) is mounted in the frame (90) of a corresponding cutter bracket (9) and presses against the inner bottom surface of the frame (90) and the clasp (75) on the cutter (7) in the corresponding cutter bracket (9).

[0025] The linkage connects to the linkage bracket (12, 12B) on the base (10, 10B), has two links (4, 4A, 4B) and may further have a linkage pintle (104), an intermediate pintle (6), a connecting tab and a cover (2, 2C).

[0026] The links (4, 4A, 4B) are longitudinal, are arranged at an interval and connect pivotally to the linkage bracket (12, 12B) and each link (4, 4A, 4B) has a connecting end and a driven end opposite to the connecting end. Each link (4, 4A) may further have a longitudinal slot (43). The connecting end connects pivotally to the linkage bracket (12, 12B) and may have a pivot hole (42). In the first and second embodiments and a fourth embodiment, the longitudinal slot (43) of each link (4, 4A) is defined through the driven end.

[0027] The linkage pintle (104) extends through the pivot holes (120, 42) in the linkage bracket (12) and the links (4, 4A, 4B).

[0028] The intermediate pintle (6) is mounted between the links (4, 4A, 4B) and is located between the connecting ends and the driven ends.

[0029] In the first embodiment and third and fourth embodiments of the hole puncher, the links (4, 4B) are separate, as shown in Figs. 2, 6 and 7.

[0030] In the second embodiment, the connecting tab connects to and is formed integrally on the links (4A), as shown in Fig. 5. In the first and fourth embodiments, the cover (2, 2C) covers the links (4).

[0031] The activating member (3) connects pivotally to and is located between the links (4, 4A, 4B) of the linkage, may connect pivotally to the intermediate pintle (6) of the linkage and has a pressing member and an intermediate connecting member (31, 31B).

[0032] The pressing member is flat and abuts the top ends of the cutters (7). When the linkage driven to pivot down, the activating member (3) moves down and the pushing board presses the cutters (7) to moves down to cut through paper sheets.

[0033] The intermediate connecting member (31, 31B) is formed on the activating member (3), connects pivotally to the links (4, 4A, 4B) and may connect pivotally to the intermediate pintle (6). In the first, second and fourth embodiments, the intermediate connecting member (31) is a pivot hole through which the intermediate pintle (6) extends. In the third embodiment, the intermediate connecting member (31B) is a semicircular recess with which the intermediate pintle (6) engages rotatably, as shown in Fig. 6.

[0034] The handle (1,1C) connects pivotally to the handle bracket (11, 11B) on the base (10,10B) and selectively drives the driven ends of the links (4, 4A, 4B) of the linkage to pivot down to lower the activating member (3) to push the cutters (7) down. The handle (1, 1C) has a connection end, a push end and a driving member (105, 105B) and may further have a handle pintle (103).

[0035] The connection end connects pivotally to the handle bracket (11, 11B) and may further have a pivot hole (101).

[0036] The handle pintle (103) extends through the pivot holes (101, 110) of the handle (1, 1 C) and the handle bracket (11, 11B).

[0037] The push end is opposite to the connection end and may be pushed by a user.

[0038] The driving member (105, 105B) is mounted on the handle (1, 1C) near the connection end and connects to and selectively drives the driven ends of the links (4, 4A, 4B) of the linkage to pivot down. In the first, second and fourth embodiments, the driving member (105) extends rotatably and slidably through the longitudinal slots (43) in the links (4, 4A) of the linkage. In the third embodiment, the driving member (105B) slidably and rotatably abuts the driven ends of the links (4B).

[0039] With reference to Fig. 7, the lock device in the fourth embodiment is mounted between the cover (2C) of the linkage and the handle (1C) and has a locking hole (23C), a mounting slot (109C) and a slide switch (25C). The locking hole (23C) is defined in the cover (2C) and has an inner surface. The mounting slot (109C) is defined through the handle (1C). The slide switch (25C) is mounted slidably through the mounting slot (109C), selectively locks the handle (1C) on the cover (2C) and has a slide tab (251), a strip (252) and a hook (253). The slide tab (251) is mounted slidably on the handle (1C). The strip (252) is formed on and protrudes perpendicularly from the slide tab (251) and has a distal end extending in the locking hole (23). The hook (253) is formed on the distal end and selectively hooks the inner surface of the locking

hole (23) to lock and prevent the handle (1C) from pivoting inadvertently.

[0040] When the user pushes the push end of the handle (1, 1C) with a force, a torque arm for the force from the push end to the handle pintle (103) is much larger than an anti-torque arm for a reacting force from the handle pintle (103) to the driving member (105, 105B). The user saves effort when driving the linkage down. Furthermore, another torque arm for a stress from the driving member (105, 105B) to the linkage pintle (104) is twice as long as another anti-torque arm for a reacting stress from the linkage pintle (104) to the intermediate pintle (6). Therefore, the user further saves effort when driving the cutters (7) down.

[0041] Accordingly, the hoe puncher is effort-saving and is convenient for people to use.

Claims

1. A hole puncher comprising:

a base (10, 10B) having
a front end;
a rear end;
a bottom surface;
a top surface;
multiple through holes (14) defined through the base (10, 10B) in a row;
a linkage bracket (12, 12B) attached to the front end of the base (10, 10B); and
a handle bracket (11, 11 B) attached to the rear end of the base (10, 10B);
multiple cutter brackets (9) being hollow, mounted on the base (10, 10B) and corresponding respectively to the through holes (14) and each cutter brackets (9) having a guide hole (92) defined through the cutter bracket (9) and aligned with a corresponding through hole (14) in the base (10, 10B);
multiple cutters (7) corresponding respectively to the cutter brackets (9), slidably mounted respectively through the guide holes (92) and each cutter (7) having
a top end;
a bottom end;
a blade formed on the bottom end; and
a clasp (75) mounted radially on the cutter (7) and selectively abutting a corresponding cutter bracket (9);
multiple springs (8) corresponding respectively to and mounted respectively in the cutter brackets (9), pressing respectively against the clasps (75) and respectively biasing the cutters (7) up from extending completely through the cutter brackets (9);
a linkage connecting to the linkage bracket (12, 12B) on the base (10, 10B) and having two links (4, 4A, 4B) being longitudinal, arranged at an interval and connecting pivotally to the linkage bracket (12, 12B), and each link (4, 4A, 4B) having
a connecting end connecting pivotally to the linkage bracket (12, 12B); and
a driven end opposite to the connecting end;
characterized by
an activating member (3) connecting pivotally to and located between the links (4, 4A, 4B) of the linkage and having
a pressing member being flat and abutting the top ends of the cutters (7); and
an intermediate connecting member (31, 31B) formed on the activating member (3) and connecting pivotally to the links (4, 4A, 4B); and
a handle (1, 1 C) connecting pivotally to the handle bracket (11, 11 B) on the base (10, 10B) and selectively driving the driven ends of the links (4, 4A, 4B) to pivot down and having
a connection end connecting pivotally to the handle bracket (11, 11B);
a push end being opposite to the connection end; and
a driving member (105, 105B) mounted on the handle (1, 1C) near the connection end and connecting to and selectively driving the driven end of the links (4, 4A, 4B) to pivot down.

2. The hole puncher as claimed in claim 1, wherein the linkage further has a cover (2, 2C) covering the links (4).

3. The hole puncher as claimed in claim 2, wherein:

each link (4, 4A) further has a longitudinal slot (43) defined through the driven end;
the driving member (105) extends rotatably and slidably through the longitudinal slots (43) in the links (4, 4A).

4. The hole puncher as claimed in claim 1, wherein the driving member (105B) slidably and rotatably abuts the driven ends of the links (4B).

5. The hole puncher as claimed in claim 3, wherein:

the linkage bracket (12) is U-shaped, has two wings and is mounted on the bottom surface of the base (10) with the wings extending up through the base (10) out of the top surface; and
the handle bracket (11) is U-shaped, has two wings and is mounted on the bottom surface of the base (10) with the wings of the handle bracket (11) extending up through the base (10) out of the top surface.

6. The hole puncher as claimed in claim 4, wherein the

linkage bracket (12B) is formed integrally on the front end of the base (10B), and the handle bracket (11B) is formed integrally on the rear end of the base (10B).

7. The hole puncher as claimed in claim 3 further comprising a lock device mounted between the cover (2C) of the linkage and the handle (1C) and having a locking hole (23C) defined in the cover (2C) and having an inner surface;
a mounting slot (109C) defined through the handle (1C); and
a slide switch (25C) mounted slidably through the mounting slot (109C), selectively locking the handle (1C) on the cover (2C) and having
a slide tab (251) mounted slidably on the handle (1C);
a strip (252) formed on and protruding perpendicularly from the slide tab (251) and having a distal end extending into the locking hole (23); and
a hook (253) formed on the distal end and selectively hooking the inner surface of the locking hole (23).

8. The hole puncher as claimed in claim 3, wherein:

each cutter bracket further has
a frame (90) being hollow and having an inner top surface and an inner bottom surface;
a seat (91) formed on the frame (90) and mounted on the base (10, 10B); and
a gap defined between the frame (90) and the seat (91) and adapted to receive a paper sheet;
the guide hole of each cutter bracket is defined through the frame (90) and the seat (91) and communicates with the gap of the cutter bracket; and
each spring is mounted in the frame (90) of a corresponding cutter bracket (9) and presses against the inner bottom surface of the frame (90) and the clasp (75) on the cutter (7) in the corresponding cutter bracket (9).

9. The hole puncher as claimed in claim 4, wherein:

the linkage further has an intermediate pintle mounted between the links (4, 4A, 4B) and located between the connecting ends and the driven ends; and
the intermediate connecting member (31B) is a semicircular recess with which the intermediate pintle (6) engages rotatably.

Patentansprüche

1. Locher, umfassend:

ein Unterteil (10, 10B), aufweisend
ein vorderes Ende,
ein hinteres Ende,
eine untere Fläche,
eine obere Fläche,
mehrere durchgehende Bohrungen (14), die in einer Reihe durch das Unterteil (10, 10B) hindurch bestimmt sind,
einen Verbindungswinkel (12, 12B), der am vorderen Ende des Unterteils (10, 10B) befestigt ist, und
einen Griffwinkel (11, 11B), der am hinteren Ende des Unterteils (10, 10B) befestigt ist,
mehrere Schneidhalter (9), die hohl sind und am Unterteil (10, 10B) befestigt sind und jeweils den durchgehenden Bohrungen (14) entsprechen, und wobei jeder Schneidhalter (9) ein Führungsloch (92) aufweist, das durch den Schneidhalter (9) hindurch bestimmt und an einer entsprechenden durchgehenden Bohrung (14) im Unterteil (10, 10B) ausgerichtet ist,
mehrere Schneidelemente (7), die jeweils den Schneidhalter (9) entsprechen und verschiebbar durch die Führungslöcher (92) hindurch montiert sind, und wobei jedes Schneidelement (7) Folgendes aufweist:

ein oberes Ende,
ein unteres Ende,
eine Schneide, die am unteren Ende geformt ist, und
eine Klammer (75), die radial am Schneidelement (7) befestigt ist und gezielt an einen entsprechenden Schneidhalter (9) angrenzt,

mehrere Federn (8), die jeweils den Schneidhaltern (9) entsprechen und jeweils darin montiert sind und jeweils gegen die Klammern (75) drücken und jeweils die Schneidelemente (7) nach oben vorspannen, damit sie sich vollständig durch die Schneidhalter (9) erstrecken,
eine Verbindung, die mit dem Verbindungswinkel (12, 12B) an dem Unterteil (10, 10B) verbunden ist und zwei Zwischenelemente (4, 4A, 4B) aufweist, die längs verlaufen, in einem Abstand angeordnet sind und schwenkbar mit dem Verbindungswinkel (12, 12B) verbunden sind, und wobei jedes Zwischenelement (4, 4A, 4B) Folgendes aufweist:

ein Verbindungsende, das schwenkbar mit dem Verbindungswinkel (12, 12B) verbunden ist, und
ein bewegtes Ende gegenüber dem Verbindungsende, **gekennzeichnet durch**

ein Betätigungselement (3), das schwenkbar mit den Zwischenelementen (4, 4A, 4B) der Verbindung verbunden ist und sich dazwischen befin-

det und Folgendes aufweist:

ein Druckelement, das flach ist und an die oberen Enden der Schneidelemente (7) stößt, und
ein Zwischenverbindungselement (31, 31B), das am Betätigungselement (3) geformt ist und schwenkbar mit den Zwischenelementen (4, 4A, 4B) verbunden ist, und

einen Griff (1, 1C), der schwenkbar mit dem Griffwinkel (11, 11B) an dem Unterteil (10, 10B) verbunden ist und gezielt die bewegten Enden der Zwischenelemente (4, 4A, 4B) bewegt, damit sie nach unten schwenken, und Folgendes aufweist:

ein Verbindungsende, das schwenkbar mit dem Griffwinkel (11, 11B) verbunden ist,
ein Druckende gegenüber dem Verbindungsende, und
ein Bewegungselement (105, 105B), das am Griff (1, 1C) in der Nähe des Verbindungsendes befestigt ist und mit dem bewegten Ende der Zwischenelemente (4, 4A, 4B) verbunden ist und es gezielt bewegt, damit es nach unten schwenkt.

2. Locher nach Anspruch 1, wobei die Verbindung ferner eine Abdeckung (2, 2C) aufweist, die die Zwischenelemente (4) bedeckt.

3. Locher nach Anspruch 2, wobei:

jedes Zwischenelement (4, 4A) ferner einen Längsschlitz (43) aufweist, der durch das bewegte Ende hindurch bestimmt ist;
sich das Bewegungselement (105) drehbar und verschiebbar durch die Längsschlitze (43) in den Zwischenelementen (4, 4A) erstreckt.

4. Locher nach Anspruch 1, wobei das Bewegungselement (105B) verschiebbar und drehbar an die bewegten Enden der Zwischenelemente (4B) stößt.

5. Locher nach Anspruch 3, wobei:

der Verbindungswinkel (12) Unförmig ist, zwei Schenkel aufweist und an der unteren Fläche des Unterteils (10) befestigt ist, wobei sich die Schenkel durch das Unterteil (10) aus der oberen Fläche heraus nach oben erstrecken, und
der Griffwinkel (11) U-förmig ist, zwei Schenkel aufweist und an der unteren Fläche des Unterteils (10) befestigt ist, wobei sich die Schenkel des Griffwinkels (11) durch das Unterteil (10) aus der oberen Fläche heraus nach oben erstrecken.

6. Locher nach Anspruch 4, wobei der Verbindungswinkel (12B) einteilig an dem vorderen Ende des Unterteils (10B) geformt ist und der Griffwinkel (11B) einteilig am hinteren Ende des Unterteils (10B) geformt ist.

7. Locher nach Anspruch 3, ferner umfassend eine Arretierungsvorrichtung, die zwischen der Abdeckung (2C) der Verbindung und dem Griff (1C) montiert ist und Folgendes aufweist:

eine Arretierbohrung (23C), die in der Abdekkung (2C) bestimmt ist und eine Innenfläche aufweist,
einen Montageschlitz (109C), der durch den Griff (1C) hindurch bestimmt ist, und
einen Schiebeschalter (25C), der verschiebbar durch den Montageschlitz (109C) hindurch montiert ist und den Griff (1C) gezielt an der Abdeckung (2C) arretiert und Folgendes aufweist:

einen Schieberiegel (251), der verschiebbar an dem Griff (1C) montiert ist,
einen Streifen (252), der am Schieberiegel (251) geformt ist und senkrecht von ihm absteht und ein distales Ende aufweist, das sich in die Arretierbohrung (23) erstreckt, und
einen Haken (253), der am distalen Ende geformt ist und gezielt an der Innenfläche der Arretierbohrung (23) einhakt.

8. Locher nach Anspruch 3, wobei:

jeder Schneidhalter ferner Folgendes aufweist:

einen Rahmen (90), der hohl ist und eine obere Innenfläche und eine untere Innenfläche aufweist,
eine Aufnahme (91), die an dem Rahmen (90) geformt und an dem Unterteil (10, 10B) befestigt ist, und
einen Spalt, der zwischen dem Rahmen (90) und der Aufnahme (91) bestimmt und dafür eingerichtet ist, ein Blatt Papier aufzunehmen,

wobei das Führungsloch jedes Schneidhalters durch den Rahmen (90) und die Aufnahme (91) hindurch definiert ist und mit dem Spalt des Schneidhalters in Verbindung steht, und
jede Feder in dem Rahmen (90) eines entsprechenden Schneidhalters (9) montiert ist und gegen die untere Innenfläche des Rahmens (90) und die Klammer (75) an dem Schneidelement (7) in dem entsprechenden Schneidhalter (9) drückt.

9. Locher nach Anspruch 4, wobei:

die Verbindung ferner einen Zwischenstift aufweist, der zwischen den Zwischenelementen (4, 4A, 4B) montiert ist und sich zwischen den Verbindungsenden und den bewegten Enden befindet, und
das Zwischenverbindungselement (31B) eine halbkreisförmige Vertiefung ist, in die der Zwischenstift (6) drehbar eingreift.

Revendications

1. Perforateur, comprenant :

une base (10, 10B) ayant
une extrémité avant;
une extrémité arriére ;
une surface inférieure ;
une surface supérieure ;
de multiples trous (14) débouchants définis à travers la base (10, 10B) en formant une rangée ;
une console de liaison (12, 12B) attachée à l'extrémité avant de la base (10, 10B) ; et
une console de poignée (11, 11B) attachée à l'extrémité arrière de la base (10,
10B);
de multiples consoles d'outil de coupe (9) creuses, montées sur la base (10, 10B) et correspondant respectivement aux trous (14) débouchants et chaque console d'outil de coupe (9) ayant un trou de guidage (92) défini à travers la console d'outil de coupe (9) et aligné avec un trou (14) débouchant correspondant dans la base (10, 10B) ;
de multiples outils de coupe (7) correspondant respectivement aux consoles d'outil de coupe (9), montés en coulissement respectivement à travers les trous de guidage (92), et chaque outil de coupe (7) ayant une extrémité supérieure ;
une extrémité inférieure;
une lame formée sur l'extrémité inférieure ; et
un fermoir (75) monté radialement sur l'outil de coupe (7) et butant sélectivement contre une console d'outil de coupe (9) correspondante ;
de multiples ressorts (8) correspondant respectivement aux consoles d'outil de coupe (9) et montés respectivement dans celles-ci, pressant respectivement contre les fermoirs (75) et poussant respectivement les outils de coupe (7) vers le haut pour qu'ils s'étendent complètement à travers les consoles d'outil de coupe (9) ;
une liaison se raccordant à la console de liaison (12, 12B) sur la base (10, 10B) et ayant deux liens (4, 4A, 4B) longitudinaux, agencés à un intervalle et se raccordant en pivotement à la console de liaison (12, 12B), et chaque lien (4, 4A, 4B) ayant
une extrémité de raccordement se raccordant en pivotement à la console de liaison (12, 12B) ; et
une extrémité entraînée en face de l'extrémité de raccordement ; **caractérisé par** un élément d'activation (3) se raccordant en pivotement aux liens (4, 4A, 4B) de la liaison et situé entre ces derniers et ayant un élément de pression qui est plat et qui bute contre les extrémités supérieures des outils de coupe (7) ; et
un élément de raccordement intermédiaire (31, 31B) formé sur l'élément d'activation (3) et se raccordant en pivotement aux liens (4, 4A, 4B) ; et
une poignée (1, 1C) se raccordant en pivotement à la console de poignée (11,
11B) sur la base (10, 10B) et entraînant sélectivement les extrémités entraînées des liens (4, 4A, 4B) à pivoter vers le bas, et ayant une extrémité de raccordement se raccordant en pivotement à la console de poignée (11, 11B) ;
une extrémité de poussée étant en face de l'extrémité de raccordement ; et
un élément d'entraînement (105, 105B) monté sur la poignée (1, 1C) près de l'extrémité de raccordement et se raccordant à, et entraînant sélectivement,
l'extrémité entraînée des liens (4, 4A, 4B) à pivoter vers le bas.

2. Perforateur selon la revendication 1, dans lequel la liaison a également un couvercle (2, 2C) couvrant les liens (4).

3. Perforateur selon la revendication 2, dans lequel :

chaque lien (4, 4A) a également une fente longitudinale (43) définie à travers l'extrémité entraînée ;
l'élément d'entraînement (105) s'étend de façon rotative et coulissante à travers les fentes longitudinales (43) dans les liens (4, 4A).

4. Perforateur selon la revendication 1, dans lequel l'élément d'entraînement (105B) bute en coulissement et en rotation contre les extrémités entraînées des liens (4B).

5. Perforateur selon la revendication 3, dans lequel :

la console de liaison (12) est en forme de U, a deux ailes et est montée sur la surface inférieure de la base (10) avec les ailes s'étendant vers le haut à travers la base (10) et sortant de la surface supérieure ; et
la console de poignée (11) est en forme de U,

a deux ailes et est montée sur la surface inférieure de la base (10) avec les ailes de la console de poignée (11) s'étendant vers le haut à travers la base (10) et sortant de la surface supérieure.

6. Perforateur selon la revendication 4, dans lequel la console de liaison (12B) est formée d'une seule pièce sur l'extrémité avant de la base (10B), et la console de poignée (11B) est formée d'une seule pièce sur l'extrémité arrière de la base (10B).

7. Perforateur selon la revendication 3, comprenant également un dispositif de blocage monté entre le couvercle (2C) de la liaison et la poignée (1C) et ayant un trou de blocage (23C) défini dans le couvercle (2C) et ayant une surface intérieure ;
une fente de montage (1 09C) définie à travers la poignée (1 C) ; et
un poussoir à glissière (25C) monté en coulissement à travers la fente de montage (109C), bloquant sélectivement la poignée (1C) sur le couvercle (2C) et ayant
une patte à glissière (251) montée en coulissement sur la poignée (1C) ; une bande (252) formée sur la patte à glissière (251) et faisant saillie perpendiculairement à partir de celle-ci, et ayant une extrémité distale et s'étendant dans le trou de blocage (23) ; et un crochet (253) formé sur l'extrémité distale et accrochant sélectivement la surface intérieure du trou de blocage (23).

8. Perforateur selon la revendication 3, dans lequel :

chaque console d'outil de coupe a également un cadre (90) creux et ayant une surface supérieure intérieure et une surface inférieure intérieure ;
un siège (91) formé sur le cadre (90) et monté sur la base (10, 10B) ; et
un intervalle défini entre le cadre (90) et le siège (91) et adapté pour recevoir la feuille de papier ;
le trou de guidage de chaque console d'outil de coupe est défini à travers le cadre (90) et le siège (91) et communique avec l'intervalle de la console d'outil de coupe ; et
chaque ressort est monté dans le cadre (90) d'une console d'outil de coupe (9) correspondante et presse contre la surface inférieure intérieure du cadre (90) et le fermoir (75) sur l'outil de coupe (7) dans la console d'outil de coupe (9) correspondante.

9. Perforateur selon la revendication 4, dans lequel :

la liaison a également un axe intermédiaire monté entre les liens (4, 4A, 4B) et situé entre les extrémités de raccordement et les extrémités entraînées ; et

l'élément de raccordement intermédiaire (31B) est un creux semi-circulaire avec lequel l'axe (6) intermédiaire entre en prise en rotation.

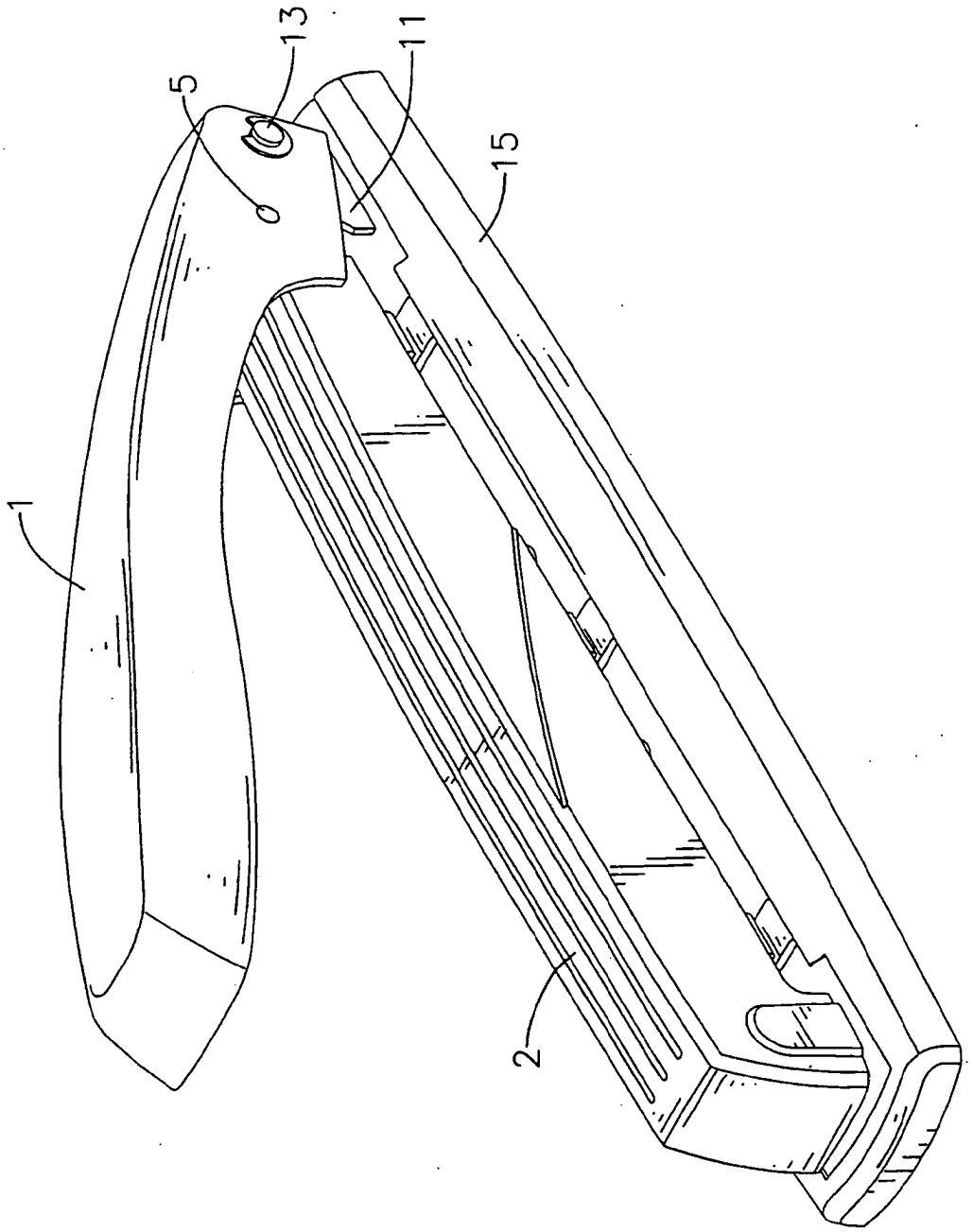

FIG. 1

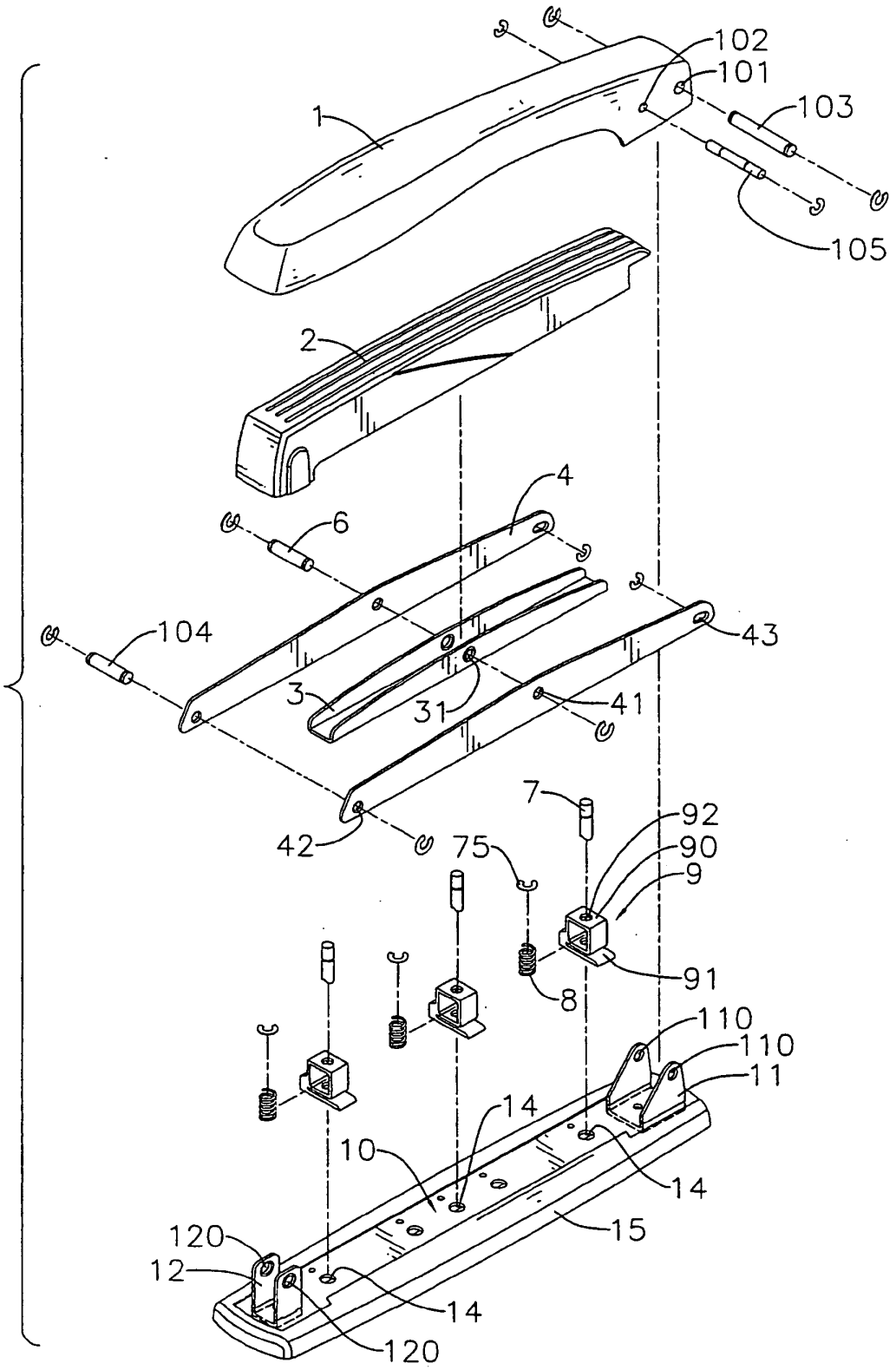
102
101
103
1
105
2
4
6
104
43
3
31
41
42
7
92
75
90
9
91
8
110
110
11
14
10
14
15
120
12
14
120

FIG. 2

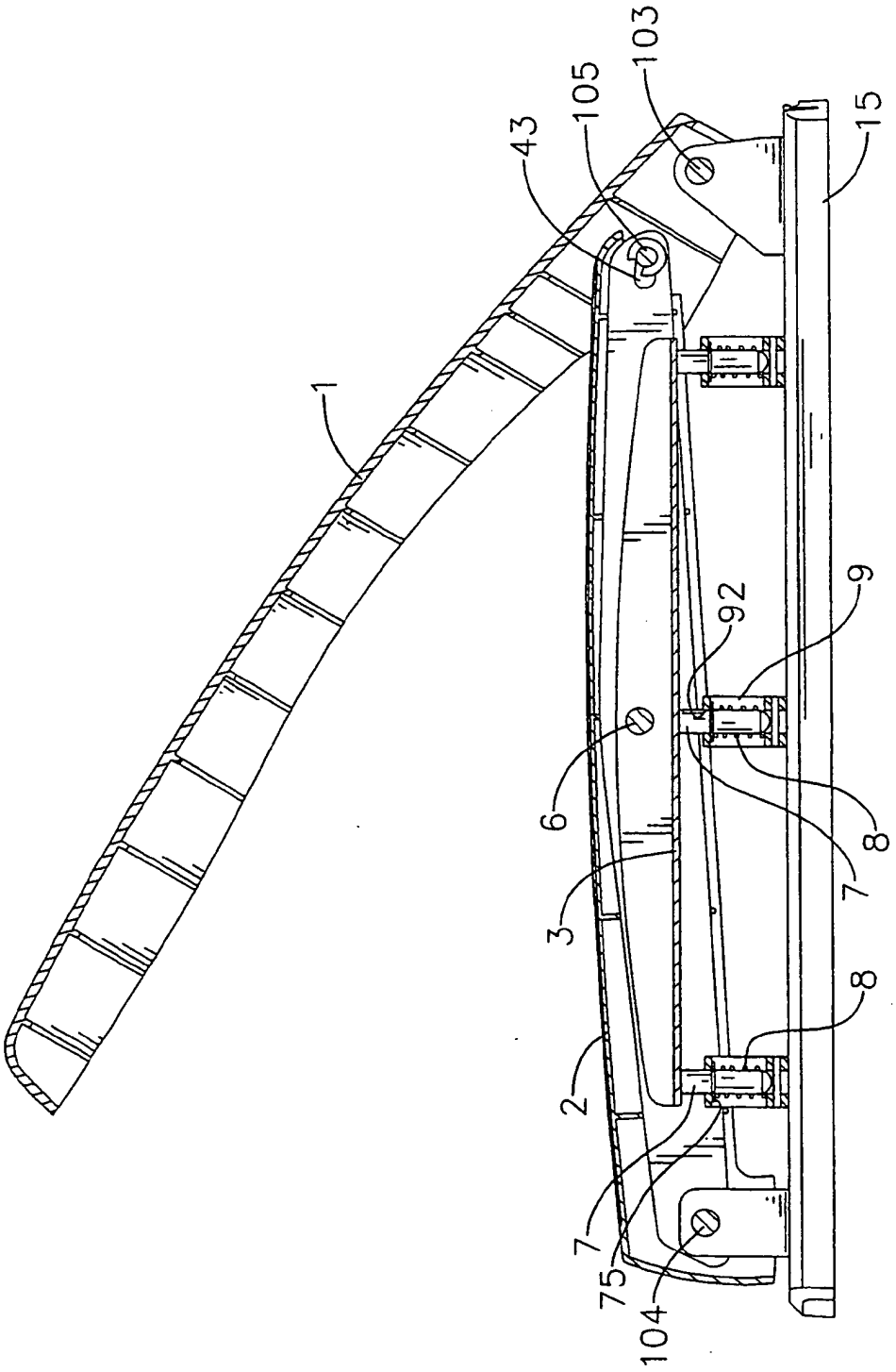

FIG. 3

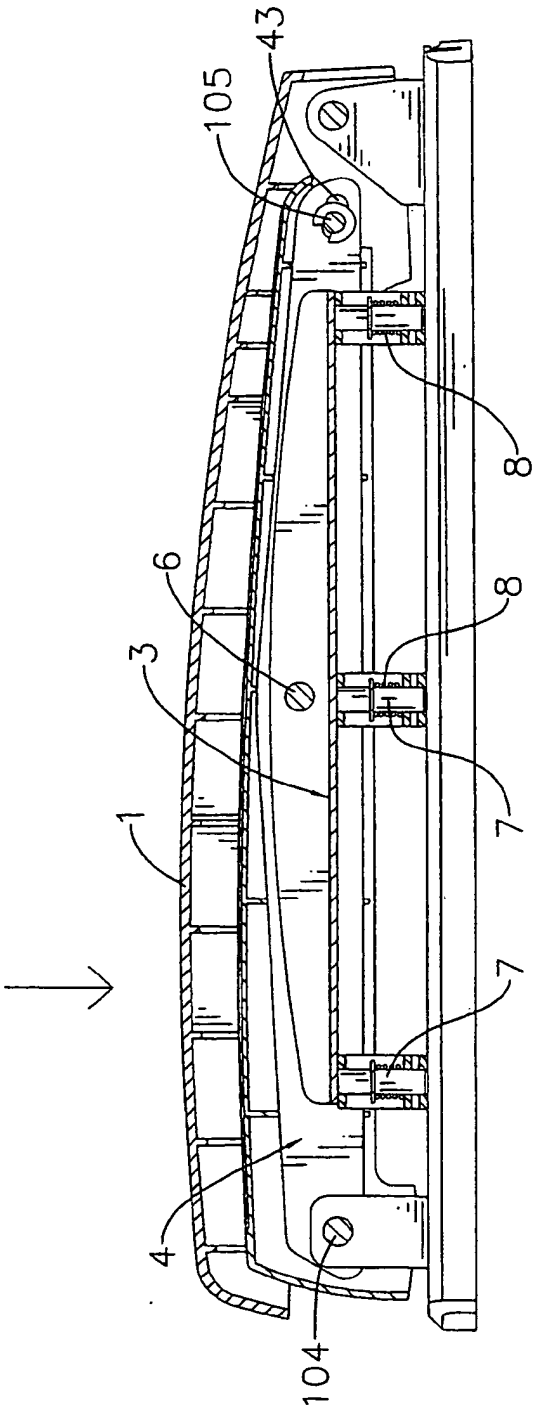

FIG. 4

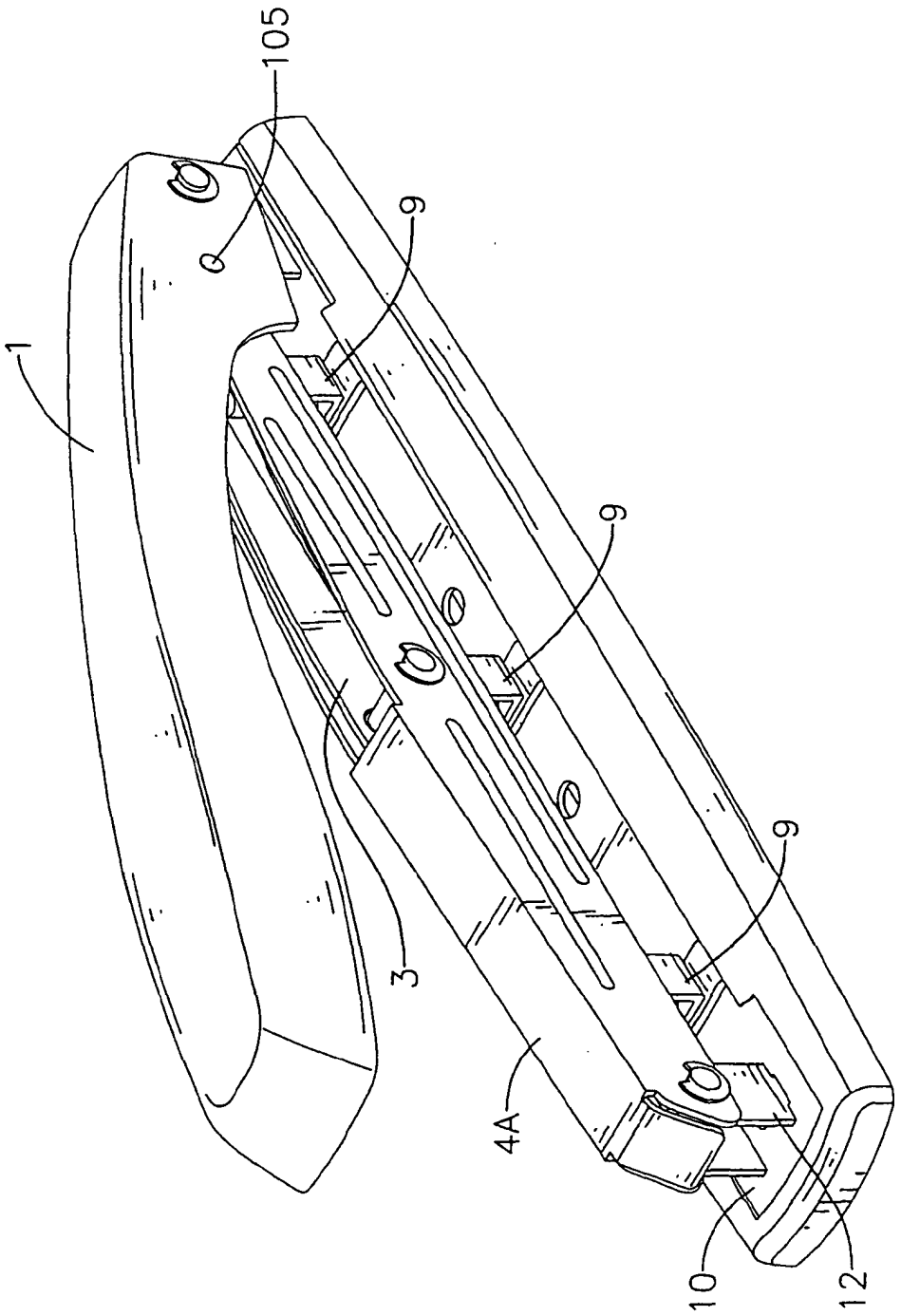

FIG. 5

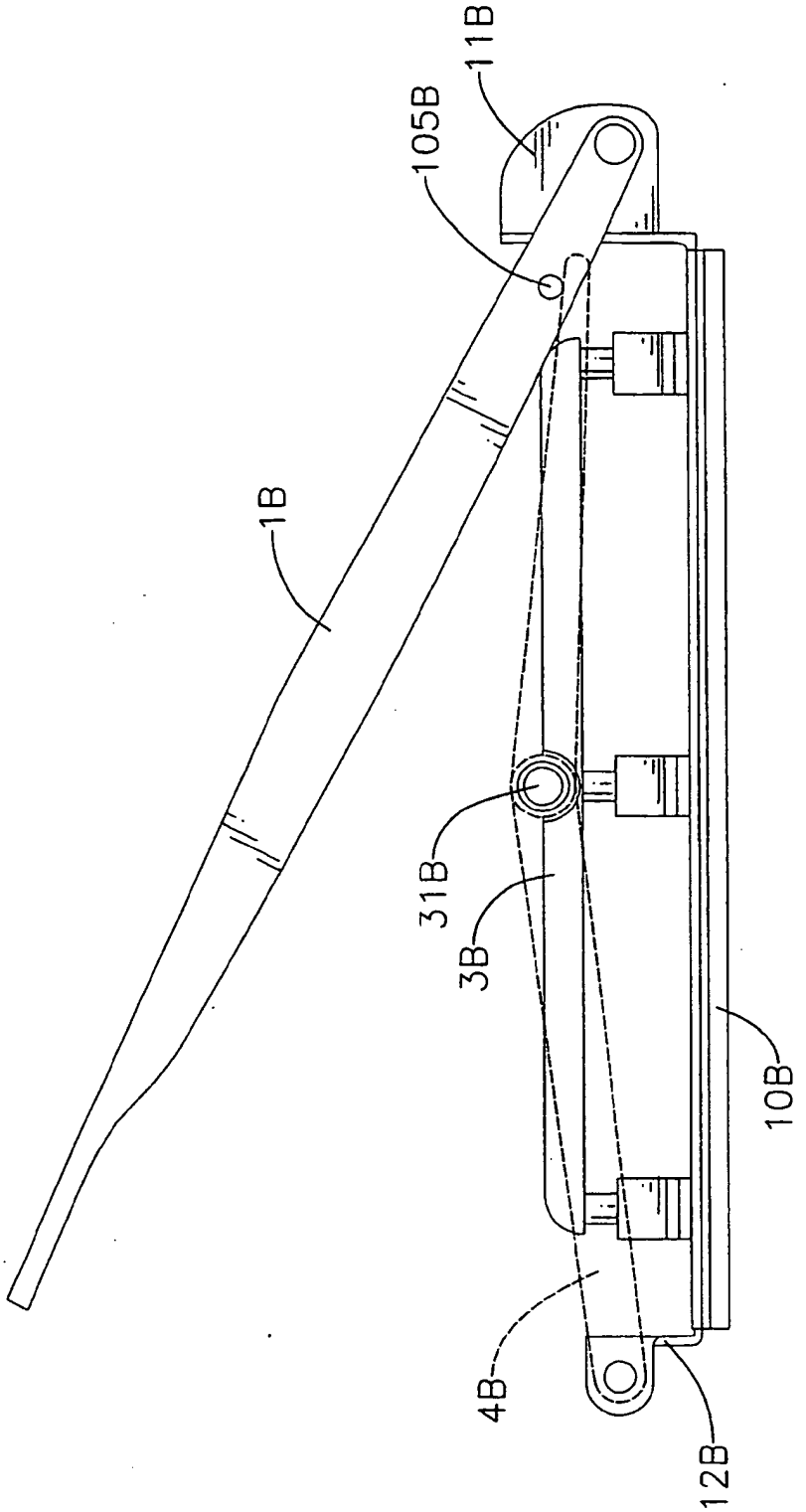

FIG.6

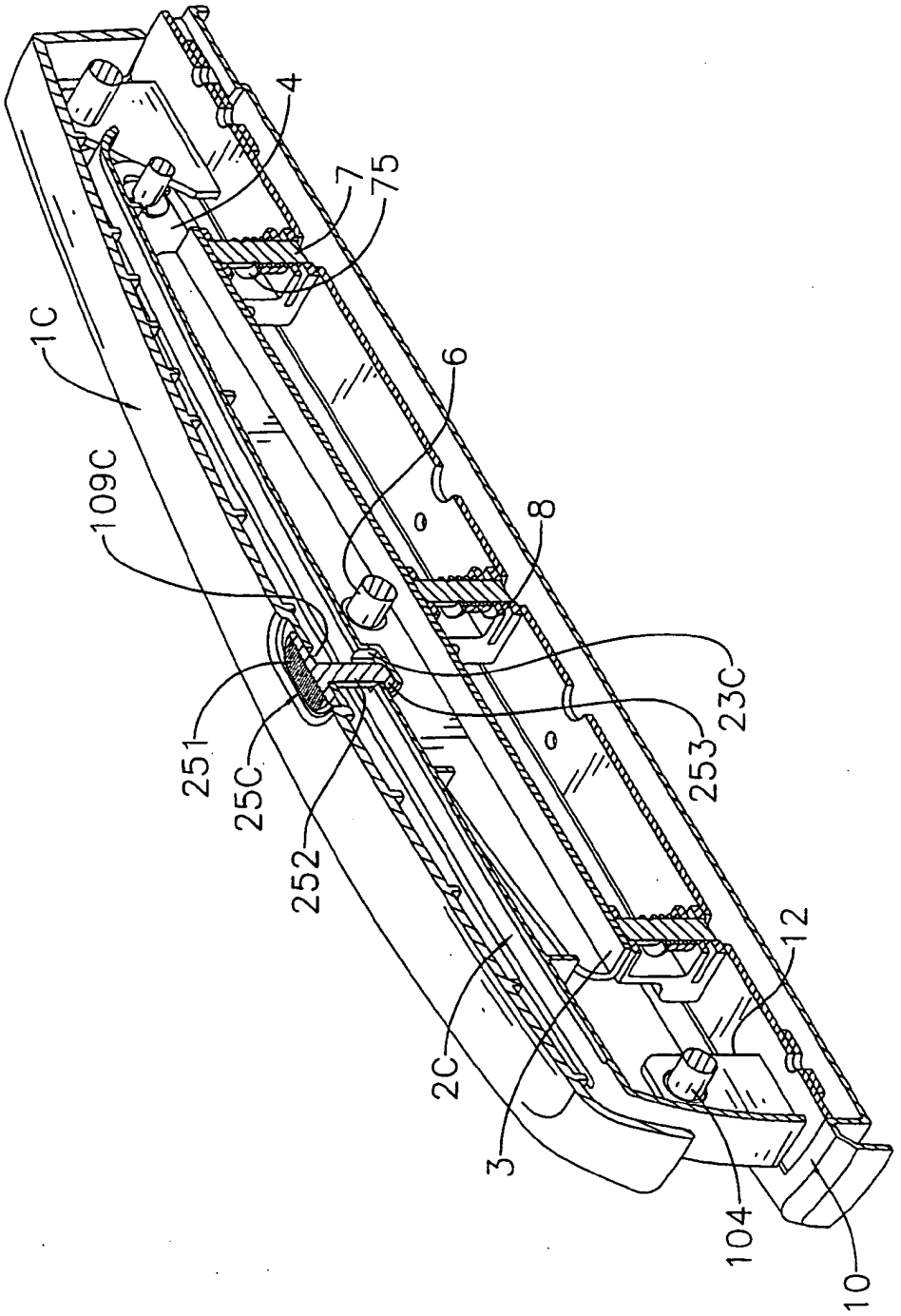

FIG. 7

REFERENCES CITED IN THE DESCRIPTION

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